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Co-401/DSUC/4th Sem/2013/N

## DATA STRUCTURE USING C

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question number 1 and any *five* from the rest.

1. Answer the following short questions :  $5 \times 2 = 10$

(a) Differentiate LIFO and FIFO.

(b) What is recursion ?

(c) What is stable sort ?

(d) Define forest in the context of tree.

(e) State pointer variable.

2. (a) Describe time-space complexity of an algorithm ? Give one example.  $4+2=6$

(b) Explain the searching techniques – sequential search and binary search.  $3+3=6$

[Turn over



3. What is tree traversal ? Write algorithms for in-order and post-order traversal.  $2+10=12$
4. (a) Define the following string operations :  $4 \times 2 = 8$
- (i) String concatenation
  - (ii) String copy
  - (iii) String compare
  - (iv) String length.
- (b) Write an algorithm for transposing a  $3 \times 3$  matrix.  $4$
5. Compare :  $3 \times 4 = 12$
- (a) Stack and queue data structure.
  - (b) Single and double linked list.
  - (c) Sequential and direct file organisations.
6. (a) Illustrate all the polish notations with the example for each.  $6$
- (b) What do you understand by garbage collection ?  $3$
- (c) What is directed and undirected graph ?  $3$



7: (a) Write an algorithm for implementing circular queue. 7

(b) Describe the concept of merging two lists. 5

8: Write short notes on any three :  $3 \times 4 = 12$

(a) Index sequential file organisation

(b) Quick sort

(c) Binary search tree

(d) Matrix multiplication.